

IN THE CLAIMS

Claims 1-17 are cancelled without prejudice or disclaimer of the subject matter therein.

Please add new claims 18-34 as follows.

**CLAIMS:**

18 (New) A method for detecting aneuploidy in one or more chromosomes of a subject simultaneously, said method comprising:

- (i) producing fluorescently-labeled polynucleotide samples that are representative of the number of each chromosome in said subject;
- (ii) further producing equivalent, non-aneuploid fluorescently-labeled polynucleotide standards for each chromosome, wherein said fluorescent label is different from that used to label said sample;
- (iii) mixing said sample and said standard with a limiting amount of binding agents for each chromosome, wherein said binding agents comprise a polynucleotide that is complementary to said sample and said standard for each chromosome immobilized onto microparticles, and said microparticles for each chromosome are distinct on a characteristic selected from the group consisting of size and fluorescent label intensity;
- (iv) wherein the fluorescent label on said microparticles, if present, has a distinct emission spectrum from both the label of said sample and said standard; and

(v) wherein the presence of an aneuploidy creates a detectable signal due to non-equal binding of said sample and said standard to said binding agent.

19. (New) The method according to claim 18, wherein said subject is a diploid organism.

20. (New) The method of claim 19, wherein said diploid organism is selected from the group consisting of a mammal and a plant.

21. (New) The method of claim 20, wherein said mammal is selected from the group consisting of a human, a livestock animal and an embryo.

22. (New) The method of claim 21, wherein said livestock animal is selected from the group consisting of cattle, sheep and horses.

23. (New) The method of claim 21, wherein said embryo is generated using *in-vitro* fertilization.

24. (New) The method of claim 23 wherein said aneuploidy is detected in said embryo prior to implantation of said embryo.

25. (New) The method according to claim 24 wherein said sample originates from a blastomere.

26. (New) The method according to claim 18, wherein said sample and said standard are produced from genomic DNA from a source selected from the group consisting of a somatic cell, a reproductive cell and a gamete.

27. (New) The method of claim 18, wherein said binding agent comprises a nucleic acid immobilized on a microparticle, said nucleic acid having binding specificity for said sample and said standard.

28. (New) The method according to claim 27, wherein said microparticles are silica microparticles.

29. (New) The method of claim 28, wherein said silica microparticles are silanized.

30. (New) A kit for the diagnosis of aneuploidy in one or more chromosomes in a subject comprising:

- (i). a first set of fluorescently labeled oligonucleotide primers suitable for the amplification of chromosome specific polynucleotide sequences;
- (ii). a second set of fluorescently labeled oligonucleotide primers with identical sequences to the first set, but comprising a different fluorescent marker with a distinct emission spectrum to said first set;
- (iii) a number of binding agents, distinct on the basis of a characteristic selected from the group consisting of microparticle size, reporter molecule, and reporter molecule intensity, wherein said binding agents are equal to the number of chromosomes in said subject, and wherein said binding agents comprise a polynucleotide sequence complementary to the predicted amplicon of the oligonucleotide primers which is immobilized to a labeled or unlabelled microparticle;
- (iv) wherein the label of said microparticles, if present has a distinct emission spectrum to the label of both said first and said second set of oligonucleotide primers; and
- (v) instructions for use of said kit.

31. (New) The kit of claim 30, wherein said subject is a diploid organism

32. (New) The method of claim 31, wherein said diploid organism is selected from the group consisting of a plant and a mammal.
33. (New) The kit of claim 32, wherein said mammal is selected from the group consisting of a human, a livestock animal and an embryo.
34. (New) The method of claim 33, wherein said livestock animal is selected from the group consisting of cattle, sheep and horses.